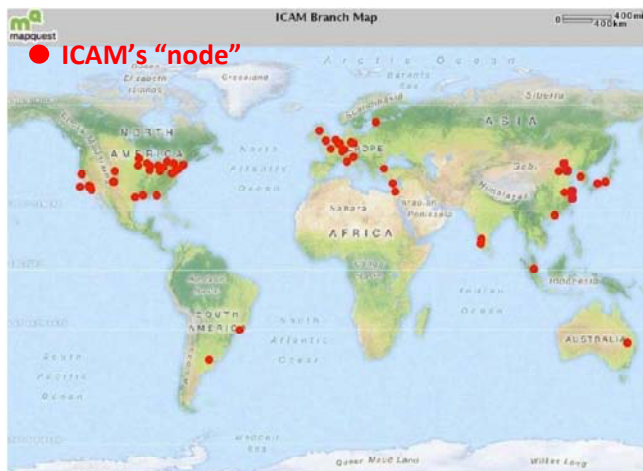


## Mid-European Consortium – ICAM/I2CAM

Briefly about ICAM-I2CAM (<http://icam-i2cam.org/>):



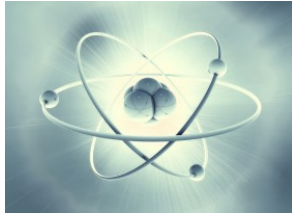
The principal goal of ICAM-I2CAM is to provide a platform for scientists that work together to advance our understanding of frontier sciences and explore new possibilities in research.

### Membership Benefits

- As a global institution, with 36 branches in the United States and another 39 in Europe, Asia, South America, the Mid-East, Canada, and Australia, ICAM provides unique global access for its branch member scientists to new research and educational initiatives and a significant global platform for sharing their research findings and educational innovations.
- ICAM’s international component, I2CAM (the International Institute for Complex Adaptive Matter) provides an unparalleled set of research opportunities in Europe, the Mid-East, and Asia for both junior and senior researchers at ICAM branch member institutions. Junior researchers receive support to attend workshops and summer schools abroad and to visit and develop collaborations at leading overseas laboratories, while senior scientists receive support to initiate or expand collaborations with their colleagues at the seventy-one overseas institutions presently affiliated with ICAM.
- ICAM offers new modalities for enhancing cross-disciplinary research at a branch member campus. These include “worked” examples of mechanisms developed at ICAM branches for organizing interdisciplinary research seminars and improving communication between scientists in different departments and colleges.
- Becoming part of ICAM’s growing global science education and engagement network offers a way to enhance substantially local campus education and outreach efforts through workshops and access to materials developed and lessons learned at other ICAM institutions.
- ICAM is a bottom-up institution. Branch member scientists play a leadership role in ICAM and I2CAM and have privileged access to all ICAM-sponsored activities. Each branch names one member to the ICAM Board of Governors, Science Steering Committee, and Fellow Selection Committee, and is entitled to send at least two scientists to any ICAM-organized activity, and up to four representatives to the branch-members-only Annual Conference that brings together leading members of the ICAM community for 2.5 days each year. Participation by graduate students, postdocs, and junior staff in ICAM activities enables them to become connected to their counterparts at other branches and to gain international recognition.
- Only branch members can host ICAM or I2CAM Exploratory Workshops for which ICAM provides up to \$35,000 in external support. Hosting a workshop makes it easy for students and postdoctoral researchers on the campus to participate and obtain a sense of the opportunities that lie ahead for research and teaching in complex adaptive matter.
- Only branch members are eligible to join ICAM’s global working groups on energy, novel superconductors, and science education and engagement, and its nascent global research networks.

- Only graduate students, postdoctoral, junior, and senior scientists at ICAM branches are eligible to apply for ICAM Fellowships that make it possible to carry out research at a second ICAM campus through a stipend that supplements existing support.

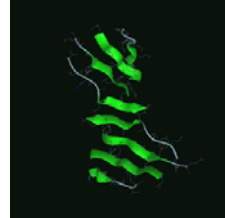
**ICAM-I2CAM scientists presently work in the following areas:**



**Quantum Matter**

ICAM-I2CAM scientists seek to identify the organizing principles responsible for the remarkable range of quantum phases observed in

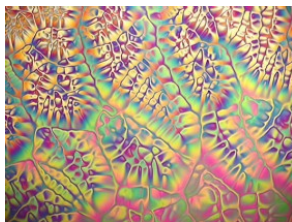
strongly correlated electron systems, such as the heavy electron materials and the “high  $T_c$ ” cuprate superconductors, and to discover new ones. Considerable attention has also gone to the properties of memristors, new device elements, topological insulators, and cold atom systems



**Biological Matter**

ICAM-I2CAM scientists work together to understand the organizing principles underlying the diverse

phenomena of biological matter. Among the topics of recent workshops and research are: protein folding, amyloidogenic proteins, the physical aspects of astrocytes, cytoskeletal function and mechanics, and quantum coherence effects in biological systems.



**Soft Matter**

ICAM-I2CAM researchers also actively explore the organizing principles of soft matter systems, such as liquid crystals, colloidal

suspensions, jamming, self-assembly, and polymer blends. These intriguing fragile forms of matter easily respond to mechanical stresses, electric and magnetic fields, temperature variations, and light, assuring a richness of physics phenomena and a wealth of technological applications.



**Novel Materials for Sustainable Energy**

ICAM has initiated a thrust to work on new materials for sustainable energy,

which includes a focus on: superconductivity for the smart grid, strongly correlated electronic materials for energy storage, and novel photovoltaic materials.

Additional details about the accomplishments and scope of the ICAM science and research effort may be found on the following links:

- [ICAM Publications](#) lists the publications and preprints that acknowledge discussions at ICAM/I2CAM workshops or direct ICAM/I2CAM support.
- [ICAM Collaborations](#) are ICAM/NSF-supported research collaborations in which researchers at different institutions share graduate students and postdoctoral researchers
- [ICAM Research Networks](#) arise out a desire by participants in its exploratory workshops to accelerate the research progress that integration and collaboration make possible. Seed support from ICAM makes possible the establishment and initial operation of research networks that link ICAM researchers in US and overseas branches.
- [ICAM Research Updates](#) describe, in non-technical terms, significant research results arising out of ICAM workshops and collaborations.
- ICAM Workshops and Symposia contains links to previous ICAM exploratory workshops and frontier symposia

## Need for a Mid-European Consortium

Participation in various international organizations is often a big challenge for Mid-European institutions. Due to their relatively small size, and thus marginal impact on the decisions taken by these associations they are sometimes even de-motivated to participate. Furthermore, often there are participation related costs which present an insurmountable obstacle.

### Advantages of Mid-European networking:

It is quite unique that six state capitals (Vienna, Bratislava, Budapest, Zagreb, Ljubljana, Prague) can be found within a radius of ~250 km. By definition they are centres of political, administrative, cultural and scientific life of various nations. Mid-Europe also presents quite a rare example of a dense collection of universities and research centres with long and rich traditions (e.g. Krakow, Pecs, Brno, Graz). Although in all of these centres groups of excellent researchers perform excellent work, a critical mass is often missing to place the Mid-European universities on the scientific map of prominent centres which define the future prospects and perspectives of the world. Despite the profound historical and cultural ties among them, they often act separately, instead of building strong collaborative networks which may promote the whole region. Consequently, often the most talented and highest-quality students/researchers from Mid-Europe are recruited by more self-promoting and challenging environments, scientifically and technologically advancing these other parts of the world. This is illustrated by the fact that on the individual level a number of Mid-European scientists are among the best in the world. **Thus it is highly appealing to try to finally use this diversity and high density of excellence to the advantage of the researchers working in Mid-Europe.**

### Participation in ICAM-I2CAM

By participating in ICAM-I2CAM programs any of the Mid-European institution that has interest in organizing principles of emergence in matter could profit importantly. However, the **subscription fee is \$ 10 000 per year with a 3 year commitment (or \$25 000 if paid as a lump sum)**, and it would be illusionary to expect that only due to the paid participation fees any of the Mid-European institutions becomes an important partner in such a multinational organization. However, if Mid-European institutions organize a “node” and have a common representative in this and similar organizations perspectives significantly improve. Not only that the participation fee would considerably decrease for each Mid-European partner (estimated then to 2 000 - 3000 Euros per year) but the consortium could start to have with time an important voice in decision making.

Preliminary discussions with various potentially interested organizations in the ICAM-I2CAM programs already took place. While TU-Wien (Vienna, Austria), IF (Zagreb, Croatia), IJS (Ljubljana, Slovenia) already expressed their interest and readiness to fulfil their part of financial obligations, positive reactions were also obtained from:

- P. Javorský, Prague (<http://kfl.cz/en/staff>)
- A. Halbritter, Budapest (<http://dept.phy.bme.hu/staff/halbritt/halbritt.html>)